(No Model.) 2 Sheets—Sheet 1.

J. BURKETT.

LOCOMOTIVE FURNACE.

No. 330,819. Patented Nov. 17, 1885.

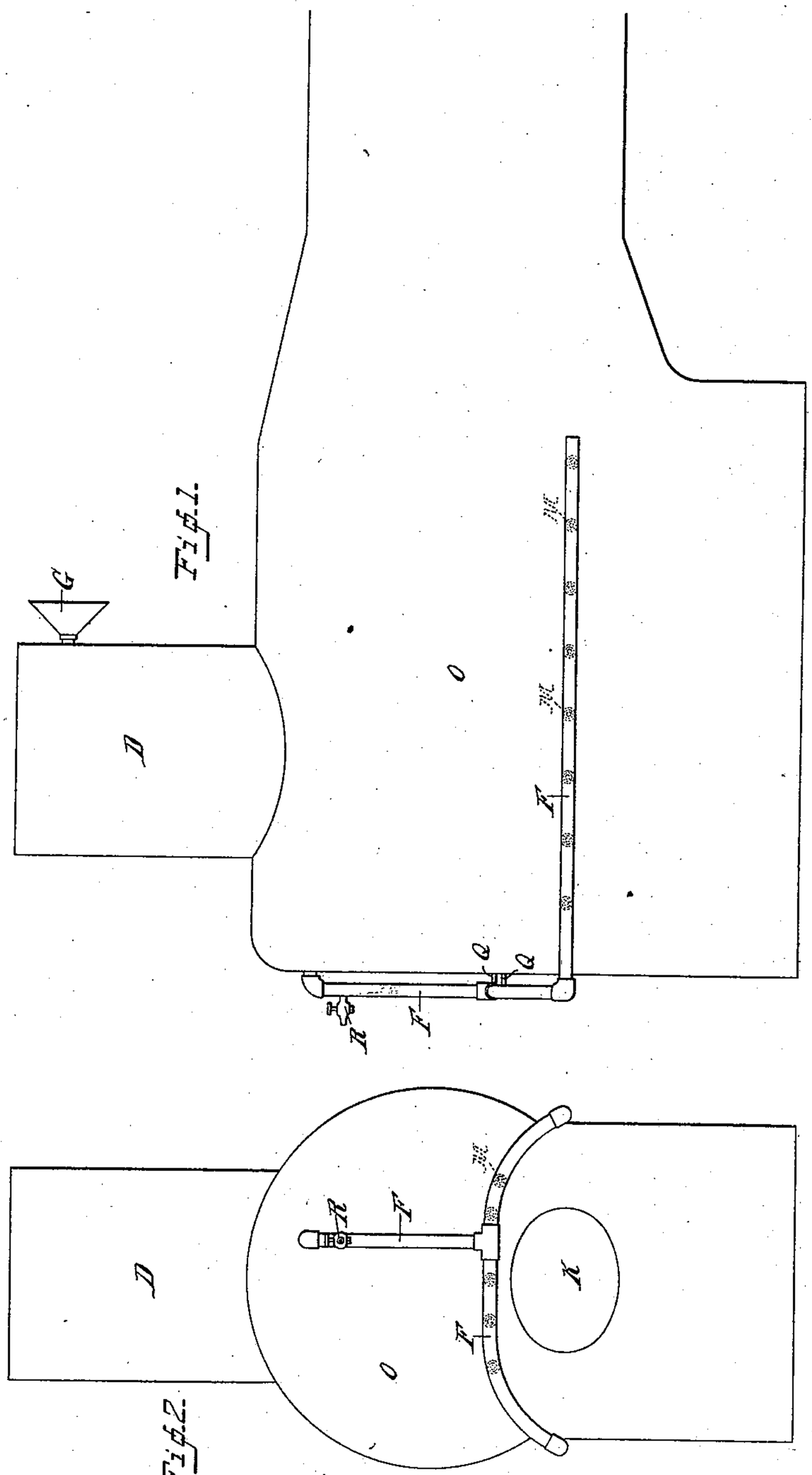

Fig. 1.

Fig. 2.

Witnesses,
E. C. Perkins.
C. E. Ruggles.

Inventor,
James Burkett
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Atty.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

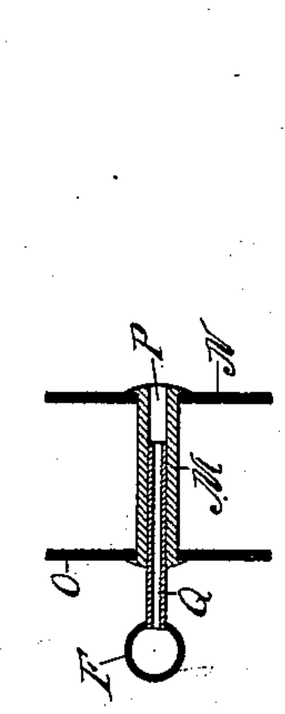

Fig. 2.

Fig. 4.

Witnesses,
C. C. Perkins.
C. E. Ruggles.

Inventor,
James Burkett
By A. H. Wooster
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UNITED STATES PATENT OFFICE.

JAMES BURKETT, OF FALLS VILLAGE, CONNECTICUT, ASSIGNOR OF TWO-THIRDS TO NICHOLAS SLINGLAND, OF SAME PLACE.

LOCOMOTIVE-FURNACE.

SPECIFICATION forming part of Letters Patent No. 330,819, dated November 17, 1885.

Application filed August 25, 1885. Serial No. 175,260. (No model.)

To all whom it may concern:

Be it known that I, JAMES BURKETT, a citizen of the United States, residing at Falls Village, in the county of Litchfield and State of Connecticut, have invented certain new and useful Improvements in Locomotive-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to secure perfect consumption of the gaseous products of combustion and the cinders by admitting air into the furnace over the fire—in other words, to consume the smoke in locomotive-furnaces.

The marked features of my invention are that it can be applied to any locomotive, new or old, and at very slight expense.

My invention is fully illustrated in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of the furnace, a portion of the boiler, and the dome of an ordinary locomotive with my invention applied. Fig. 2 is a rear view; Fig. 3, a vertical longitudinal section of the boiler, furnace, and dome; Fig. 4, a vertical transverse section of the same; and Fig. 5, a detail view of one of the hollow stay-bolts, showing the manner in which air is admitted to the furnace.

Similar letters denote the same parts in all the figures.

A represents the furnace, B the tubes of the boiler, C water-space, D the dome, and E the crown-bars, all of which may be of any ordinary or desired construction.

In practice the water-line in boilers of the class illustrated will be slightly above the crown-bars, the remaining space in the boiler and the dome being filled with steam.

It is of course well understood by those familiar with this class of furnaces that, owing to the strong draft required and imperfect combustion, large quantities of fuel pass out from the furnace in an unconsumed condition in the form of cinders and gases.

The object of my invention is to wholly consume the gaseous products of combustion and the cinders by omitting the necessary quantity of highly-heated air to the furnace over the fire. For this purpose I provide a pipe, F, having a funnel-shaped opening, G, which takes in external air, and after passing through the dome and the upper portion of the boiler passes out at the rear of the boiler and then delivers the air within the furnace.

The exact location of pipe F is not of the essence of my invention. I preferably arrange said pipe to pass through the dome and the upper portion of the boiler, as shown in Figs. 3 and 4, but whether the pipe is surrounded by water or by steam, or lies partially in water or partially in steam, is wholly immaterial.

I have shown in Fig. 3 in dotted lines a modified form, in which pipe F does not extend into the dome at all, but extends forward through the upper portion of the boiler, and may be arranged to take in air at any convenient place. After passing out at the rear of the boiler, pipe F preferably branches, and then passes across the rear of the boiler, just over the furnace-door K and on opposite sides of the furnace, as clearly shown in Figs. 1 and 2.

M represents stay-bolts, by which plate N of the furnace and plate O of the boiler are rigidly secured together. These stay-bolts are ordinarily made three-fourths or seven-eighths of an inch in diameter. The only change required by my invention is that they be made about one and one-fourth inch in diameter and be provided with central openings, P, extending through them.

Q represents pipes leading from pipe F and extending into and partially or entirely through openings P in the stay-bolts.

R is a stop-cock in pipe F, which may be partially opened should the supply of air be too great in the furnace.

The great advantage gained through the use of my invention is economy in the consumption of fuel. I have found in actual practice that the saving is very great, as is shown by the fact that no cinders are thrown into the smoke-box, (not shown,) and that the smoke-stack does not discharge any of the dense

black smoke, which has never heretofore been avoided. No changes whatever are required to adapt it to any locomotive, no air-space or extra fuel is required to heat the air. The pipes are simply passed through the dome or boiler, or both, and the air admitted to the furnace through the stay-bolts, it being necessary, of course, to use longer stay-bolts with openings through them.

Having thus described my invention, I claim—

1. The combination, with the boiler and furnace of a locomotive, of a pipe, F, which passes through the dome and boiler, or either of them, and is adapted to take in external air, stay-bolts which connect the boiler-plate with the furnace-plate and have central openings through them, and pipes Q, which convey air from pipe F through the stay-bolts into the furnace.

2. In a locomotive, a pipe, F, having a funnel-shaped opening to take in external air, and extending through the dome and boiler and out at the rear, stay-bolts connecting the boiler-plate with the furnace-plate, and having openings through them, and pipes leading from pipe F and passing into the stay-bolts, whereby heated air is admitted to the furnace over the fire.

3. The combination, with the boiler and furnace of a locomotive, of pipe F, having a stop-cock, as shown, stay-bolts M, having openings through them, and pipes Q leading from pipe F through the stay-bolts and communicating with the furnace.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES BURKETT.

Witnesses:
A. C. RANDALL,
GEO. H. BROWN.